

STUDIES ON THE AUSTRALASIAN ASCLEPIADACEAE, IV* *DISCHIDIA* R. BR. IN AUSTRALIA

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Summary

An illustrated taxonomic account of *Dischidia* R. Br. in Australia is given, with notes on the habitat, distribution and conservation status of the three species recognised. Dimorphic leaf forms are noted and illustrated for *D. ovata* Benth.

The genus *Dischidia* R. Br. was first validly published in Brown (1810a) and not in Brown (1810b) as listed in Farr *et al.* (1979). Brown (1810b) was issued as a preprint of Brown (1811) and was intended to be simultaneously published with Brown (1810a), but the Prodrromus predates the preprint by some seven days (Mabberley 1985).

Species of *Dischidia* are widely distributed in India, south-east Asia and New Guinea with three non-endemic species occurring in the east coast tropics of Australia. No account of *Dischidia* in Australia has been provided since that of Bailey (1900). The extensive revision of Peninsular Malaysian species by Rintz (1980) has resulted in the change of one epithet for Australian material, plus the placing in synonymy of one name applied by Bailey (*op. cit.*).

While a fair number of herbarium collections of *Dischidia* exist, few are fertile (at least at BRI). This paper provides descriptions, based on fresh or spirit material, of the species in Australia.

Materials and Methods

Herbarium material at BRI and photographs of types at BM and K were examined. The descriptions of the three species are mainly based on live material collected in northern Queensland.

DISCHIDIA

Dischidia R. Br., Prod. 461 (1810); Asclepiadeae 21 (1810); Trans. Wern. Soc. Nat. Hist. 1: 32 (1811); Wallich, Pl. as. rar. 2: 35-37 (1831); Decne., Nouv. Ann. Mus. Hist. Nat., 3: 377 (1834); Decne. in DC., Prod. 8: 631-633 (1844); Wight, Contribut. 43-44 (1834); Endl., Gen. pl. 8: 596 (1838); Walpers, Ann. 3: 63 (1852); Benth. in Benth. & Hook., Gen. pl. 2: 777-778 (1876); Schumann, Nat. Pflanzenfam. 4(2): 288-289 (1897); Schlechter, Bot. Jahrb. Syst. 50: 95-104 (1914); Backer & Bakhuizen van den Brink, Fl. Java 2: 262-265 (1965); Rintz, Blumea 26: 81-126 (1980); Walker, Asklepios 35: 3-11 (1985); Walker, Asklepios 40: 75-80 (1987).
Type: *D. nummularia* R. Br.

Collyris Vahl, Skr. Naturhist.-Selsk. 6: 109 (1810). **Type:** not designated.

Conchophyllum Blume, Bijdr. 1060 (1826) non A. Schenk (1883). **Type:** *C. imbricatum* Blume ("inbricatum")

Leptostemma Blume, Bijdr. 1057 (1826). **Type:** not designated.

Dischidiopsis Schltr. in Perkins, Fragm. fl. Philipp. 128 (1904). **Type:** not designated.

Epiphytic succulent herbs with white latex. Stems slender, twining; glabrous, hirsute or tomentose; 1-4 mm diameter. Roots nodal and adventitious or only nodal. Leaves flat

* continued from Austrobaileya 2(5): 451-457 (1988)

or lens-shaped in cross-section and ovate or elliptical in outline; or shell-like being convex and partially hollow in cross-section and orbicular in outline, often occupied by ants; or pitcher-like in clusters associated with flat, ovate or elongated stems; or flat in cross-section and oblanceolate in outline; opposite (rarely alternate), margins entire, glabrous (rarely pubescent), usually with extrafloral nectary at lamina base. Inflorescence borne between petioles of leaf-pair or terminal; long-lived, a spirally-elongated umbelliform raceme bearing up to 10 flowers; single or occasionally with several racemes per peduncle. Peduncle erect at nodes, flower apices usually either horizontal or upward. Calyx 5-parted, lobes ovate, acute; usually with nectary in lobe angle. Corolla 5-parted, valvate in bud, actinomorphic or occasionally slightly zygomorphic, fleshy, narrowly or broadly urceolate; outer surface smooth and glabrous (rarely muciculate or puberulous); inner surface glabrous or pubescent; corolline corona sometimes present as 5 lobes on inner surface alternate with corolla lobes, or as annulus in inner throat. Staminal corona of erect, stalked, hyaline appendages with 2 incurved or reflexed apical lobes; nectary at base of appendage. Stamens inserted at corolla-tube base, shortly connate at base; anthers with apical membrane; pollinium in each anthercell solitary, erect, with narrow pellucid margin; translators oblong, grooved; caudicles broadly triangular. Gynostegium conical (rarely short-truncate) with conical stigma enclosed by stamens; ovaries free. Follicles narrowly conical, acuminate, smooth; terete, reniform or semi-terete in cross-section. Seeds flat, ovate, brown, comose.

Key to Australian species of *Dischidia*

1. Mature leaves often pitcher-like, corolline corona present **3. *D. major***
 Mature leaves never pitcher-like, corolline corona absent 2
2. Leaves orbicular, mealy-white, not variegated on upper surface **2. *D. nummularia***
 Leaves ovate to lanceolate, not mealy-white, variegated on upper surface **1. *D. ovata***

1. *Dischidia ovata* Benth., Lond. J. Bot. 2: 226–227 (1843); Bailey, Queensl. fl. 3: 1013 (1900); Jones & Gray, Austral. Climbing Pl. fig. 83 (1977). **Type:** New Guinea, *Hinds* (holo: K, photo!).

Stems creeping, glabrous, 1 mm diameter. Roots nodal. Leaves 2–5 cm long, 0.5–3.5 cm wide, fleshy, broadly ovate, light green to brownish, variegated on upper surface, apex apiculate; petiole 2–9 mm long, 0.75–1 mm diameter. Inflorescence 1–8-flowered on peduncle to 15 mm long, 1 mm diameter; raceme single or bifid; pedicels 3 mm long, 1 mm diameter. Calyx lobes 1 mm long, 0.75 mm wide, ovate, glabrous. Corolla 6 mm long, 4 mm diameter, tube inflated, stained with red; lobes ovate, erect, minutely papillate outside, dotted with white, 2 mm long, 1 mm wide, reflexed inside with dense ring of erect white hairs at base; corolline corona absent. Staminal corona of 5 appendages, each stalked with cordate apex and 2 incurved lobes, 1.75 mm long, 1.5 mm wide. Staminal column 3 mm long; anther wings 1 mm long; anther membranes ovate, 0.75 mm long; stigma conical, 0.25 mm long. Pollinia *ca* 0.5 mm long, *ca* 0.2 mm wide; translators *ca* 0.4 mm long, *ca* 0.1 mm wide; caudicles *ca* 0.3 mm long, *ca* 0.1 mm wide. Follicles fusiform, semi-terete in cross-section, 55–65 mm long, 8–10 mm diameter; seeds 3–4 mm long, 1–1.5 mm wide, light-brown; coma white, 8–12 mm long. **Fig. 1.**

Specimens examined: Papua New Guinea. Fife Bay, Oct 1930, *Lister Turner* AQ216510 (BRI); Kwato Is, 1893, *Cowley* AQ216511 (BRI). Australia. Queensland. COOK DISTRICT: E of "Bramwell" Homestead, on Olive River, Aug 1978, *Kanis* 2048 (BRI; CANB *n.v.*); Upper Massey Ck, *ca* 15 miles [24 km] a little S of ENE of Coen, Oct 1962, *Smith* 11888, 11752 (BRI); Saibai Is, Jul 1975, *Stocker* 1329 (BRI); Thursday Is, Jul 1975, *Stocker* 1308 (BRI); Rocky River, Sep 1973, *Doekrill* 709 (BRI); ditto, Oct 1969, *Webb & Tracey* 9484A (BRI; CANB *n.v.*); near Portland Rds, Aug 1965, *Gittins* 1040 AQ216504 (BRI); Claudie River between Portlands Rds and Iron Range, Oct 1968, *Webb & Tracey* 8570 (BRI; CANB *n.v.*); North western fall of McIlwraith Range at head of Peach Ck, Oct 1969, *Webb & Tracey* 9828 (BRI; CANB *n.v.*); Hammond Is, Jun 1897, *Bailey* AQ216508 (BRI); Massey Ck, *ca* 15 km upstream on Silver Plains Stn, Sep 1979, *Clarkson* 2595 (BRI); Leo Ck, Jul 1978, *Clarkson* 2372 (BRI); 12°41'S, 143°10'E, Nov 1984, *Liddle* 549 (BRI); 13°19'S, 143°29'E, Oct 1986, *Liddle* 693 (BRI); 13°22'S, 143°20'E, Oct 1986, *Liddle* 684; 12°44'S, 143°12'E, Oct 1986, *Liddle* 661 (BRI); Langkelly Ck, 13°53'S, 143°17'E, Nov 1984, *Liddle* 446 (BRI); ditto, Nov 1984, *Liddle* 445 (BRI); 12°44'S, 143°17'E, Oct 1986, *Liddle* 749 (BRI); ditto, Oct 1986, *Liddle* 750 (BRI). **Map 1.**

Habitat: *D. ovata* occurs as an epiphyte on various species of trees and shrubs, in deciduous vine thickets, semi-evergreen vine forest, dune woodland and riverine rainforest.

Notes and Observations: Australian material of this species may possess dimorphic foliage (Fig. 1), which can occur on the same plant. Such foliage is a product of the growth environment and is of no taxonomic significance.

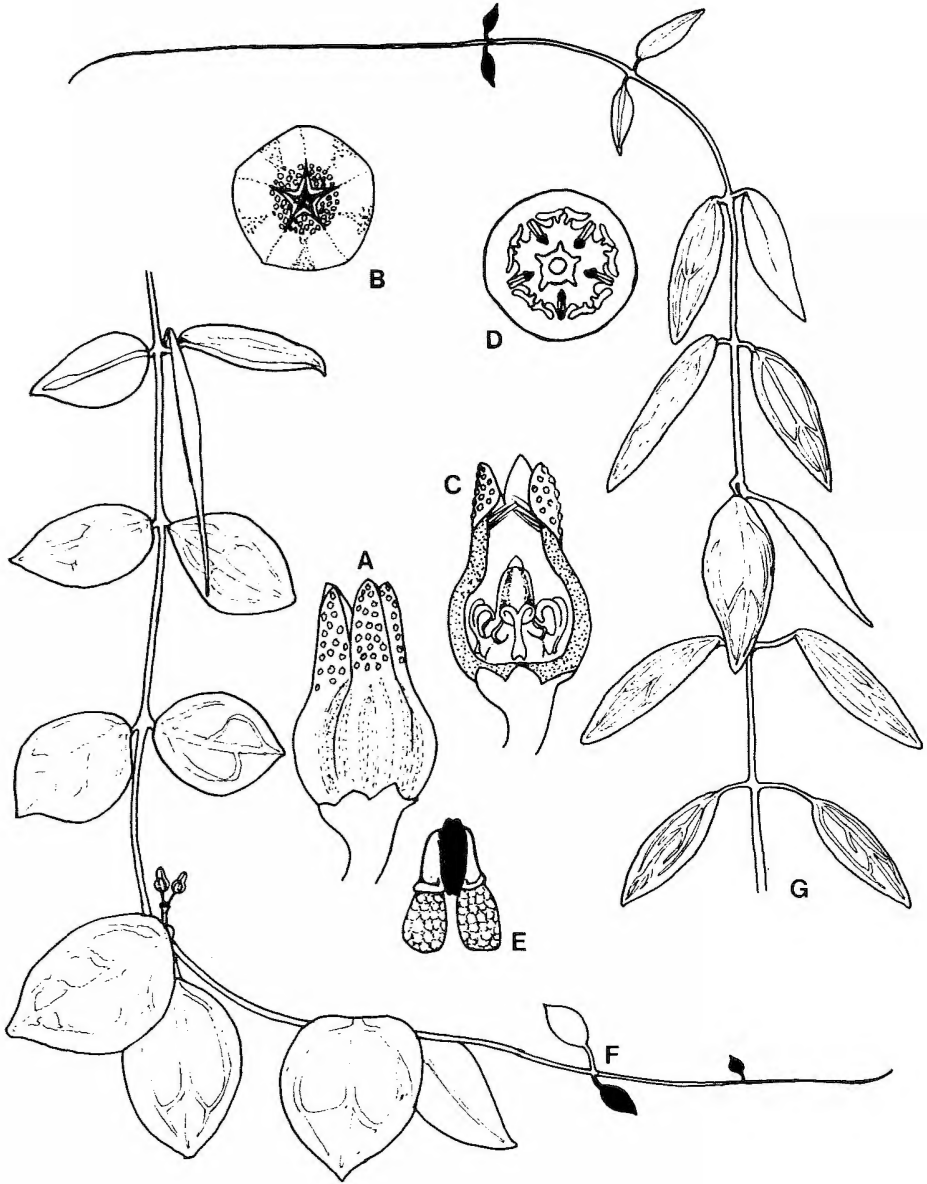


Fig. 1. *Dischidia ovata*: A. flower, side view $\times 5$. B. flower, apical view $\times 5$. C. flower, side view showing interior $\times 5$. D. corona, apical view $\times 5$. E. pollinarium $\times 15$. F. shoot with ovate leaves, inflorescence and follicle $\times 0.5$. G. shoot with acute leaves $\times 0.5$. A-F Liddle 445; G Liddle 446.

2. *Dischidia nummularia* R. Br., Prod. 461 (1810); Benth., Fl. austral. 4: 345 (1869); Bailey, Queensl. fl. 5: 1013–1014 (1902); Jones & Gray, Austral. Climbing Pl. Fig. 82 (1977); Williams, Native Pl. Queensl. 1: 96–97 (1979); Rintz, Blumea 26: 98–99, fig. 18 (1980). **Type:** Endeavour River, *Banks & Solander* (lectotype: BM, photo!).

Synonyms: See Rintz (*loc. cit.*).

Stems filiform, glabrous, 1–1.5 mm diameter. Roots nodal and adventitious. Leaves flattened-orbicular, rounded both ends or shortly cuneate at base, with minute apiculus at apex, mealy-white, 0.7–1.4 cm long, 0.7–1 cm wide; petiole 2–3 mm long, 1 mm diameter. Inflorescence 1–6-flowered on peduncle to 1 cm long, 2 mm diameter; raceme simple; pedicels 4.5–5 mm long, 1 mm diameter, glabrous. Calyx lobes ovate, glabrous, 0.5–0.7 mm long, 0.5 mm wide. Corolla white, 3–4 mm long, 2–3 mm wide; lobes ovate-acuminate, 2–2.5 mm long, 0.75–1 mm wide, top 1.5 mm with edges reflexed, ring of hairs for 0.5 mm below point of reflexing; corolline corona absent. Staminal corona of 5 appendages, each stalked with refuse apex and 2 recurved spatulate lobes, 0.5 mm long, 0.5 mm wide. Staminal column *ca* 1.5 mm long; anther wings 0.4 mm long; anther membrane ovate, 0.5 mm long; stigma conical, 0.25 mm long. Pollinia oblong, *ca* 0.2 mm long, *ca* 0.1 mm wide; translators oblong, brown, *ca* 0.1 mm long, 0.06 mm wide; caudicles broad-triangular, *ca* 0.3 mm long, *ca* 0.1 mm wide. Follicles fusiform, semiterete in cross-section, 2.5–4 cm long, 0.5–0.8 cm diameter, glabrous. Seeds 2–2.5 mm long, 1 mm wide; coma white, 10 mm long. **Fig. 2.**

Specimens examined: Queensland. COOK DISTRICT: Mabuig Is, Torres Strait, Apr 1953, *Marks & Mackerras* AQ417216 (BRI); 17.9 km by road ENE of Browns Ck towards West Claudie River, Sep 1975, *Coveny* 7157 & *Hind* (BRI; NSW *n.v.*); Weary Bay near Bloomfield, Aug 1976, *Scarth-Johnson* 206A (BRI); Jones' Lagoon near Cooktown, May 1970, *Blake* 23235 (BRI); Flying Fish Point, near Innisfail, Nov 1971, *Sharpe* 27 (BRI); Cooktown, Jul 1943, *Blake* 15074 (BRI); Bailey Ck, Oct 1962, *Smith* 11628 (BRI); Mouth of Daintree River, *Tenison-Woods* AQ216500 (BRI); Mulgrave River, undated, *Anon.* AQ216499 (BRI); Mossman, Sep 1937, *Brass & White* 330 (BRI); Cairns, Dec 1942, *Blake* 14774 (BRI); 10 miles [16 km] S of Bathurst Bay, Oct 1970, *Hyland* 4670 (BRI); *ca* 15 km upstream from the upper crossing at Massey Ck on Silver Plains Stn, Sep 1979, *Clarkson* 2642 (BRI); K. PERTH *n.v.*); Shiptons Flat, May 1948, *Brass* 20232 (BRI); Badu Is, Torres Strait, Jan 1980, *Garnett* 316 (BRI); 13°53'S, 143°13'E, Nov 1984, *Liddle* 447 (BRI). NORTH KENNEDY DISTRICT: Ingham, Mission Beach, Oct 1951, *Smith* 4885 (BRI); State Forest 702, south bank Murray River near mouth, Oct 1975, *Thorsborne* 120 (BRI); 60 km NNW of Ingham and 4 km E of Bruce Hwy, Aug 1976, *Lazarides* 8117 (BRI; CANB *n.v.*); near Cardwell, Sep 1935, *Blake* 9705 (BRI). **Map 2.**

Distribution and Habitat: *D. nummularia* is widely distributed from India across to Thailand and through peninsular Malaysia into New Guinea and Australia (Rintz 1980). In Australia (**Map 2**), the species occurs as an epiphyte, commonly on paperbarks (*Melaleuca* spp.) or associated species such as *Pandanus* and *Dillenia alata*, rarely on eucalypts, and predominantly in swampy habitats. Putative use of *D. nummularia* by ants has been disproved (at least in Malaysia) by Weir and Kiew (1986). Seedling establishment of *D. nummularia* has been shown to be optimal on brick fragments and wood crumbs in comparison to sand (Rahman & Kiew 1986).

3. *Dischidia major* (Vahl) Merr., Interpr. Herb. amboin. 437 (1917); Rintz, Blumea 26: 92, fig. 6 (1980); Williams, Native Pl. Queensl. 2: 106–107 (1984); based on *Collyris major* Vahl, Skr. Naturhist.-Selsk. 6: 460 (1810). **Type:** Malaya, *Koenig* (C) *n.v.*
- Dischidia rafflesiana* Wall.; Pl. as. rar. 2: 35 (1831); Cat. No. 4208 (1831); Bailey, Queensl. fl. 3: 1014 (1900); Jones & Gray, Austral. Climbing Pl. fig. 84 (1977); Panigrahi, Bangladesh J. Bot. 15: 195–197 (1986). **Type:** Malaya, *Koenig* (BM, photo!).
- Dischidia clavata* Wall., Pl. as. rar. 2: 36 (1831); Cat. No. 4209 (1831). **Type:** India, *Attran R., Wallich* 4209 (K) (*n.v.*)
- Dischidia timorensis* Decne., Nouv. Ann. Mus. Hist. Nat. 3: 377, t. 17 (1834); F. Muell., Syst. census Austral. pl. (1882); Bailey, Queensl. fl. 3: 1014 (1900). **Type:** Timor (*n.v.*)
- Dischidia mergensis* Becc., Malesia 2: 264 (1886). **Type:** Burma, Mergui, *Griffith* (K) (*n.v.*)
- Dischidia bauerlenii* Schltr., Bot. Jahrb. Syst. 40: 2 (1908). **Type:** Thursday Island, *Bauerlen* 99 (B) (*n.v.*)
- Dischidia pubiflora* Schltr., Beih. Bot. Centralbl. 34: 11 (1916). **Type:** Celebes, Kabetan Island, *Schlechter* 20686 (B) (*n.v.*)

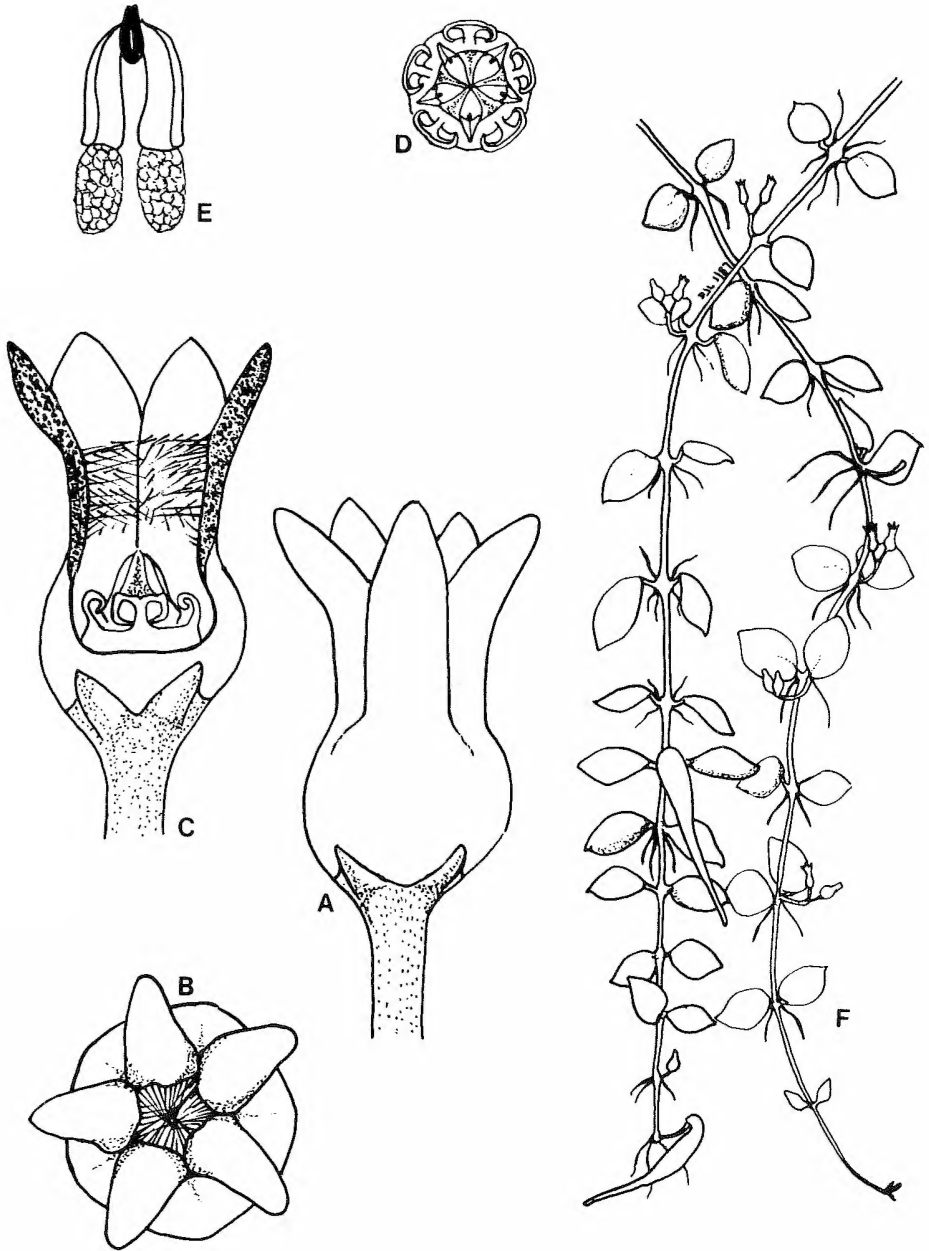


Fig. 2. *Dischidia nummularia*: A. flower, side view $\times 11$. B. flower, apical view $\times 11$. C. flower, side view showing interior $\times 11$. D. corona, apical view $\times 11$. E. pollinarium $\times 57$. F. shoot with inflorescences & follicles $\times 0.6$. A-F Liddle 447.

Stems thick, glabrous, 3–4 mm diameter. Roots nodal and adventitious. Leaves glabrous, of two types, either (a) flattened-orbicular, apex acuminate, base cuneate, 2.5–2.7 cm long, 1.6–1.8 cm wide; petiole 2–3 mm long, 1 mm diameter; or (b) pitcher-form, 8–10 cm long, 3–4 cm wide, flattened on surface adjacent to host, deep purple inside, base truncate; petiole 8 mm long, 1.5 mm diameter. Inflorescence 1–4-flowered on peduncle to 1.5 cm long, 1.5 mm diameter; raceme single or bifid; pedicels 3.5–4 mm long, 1 mm diameter, glabrous. Calyx lobes ovate, minutely denticulate on margin, 1–1.5 mm long, 1 mm wide. Corolla 3–4 mm long, 2.5–3 mm wide; lobes lanceolate-acuminate, 1.5 mm long, 0.5 mm wide, upper 1 mm of lobe reflexed with short reflexed hairs on inside; corolline corona of 5 shallow lobes at base of lobes. Staminal corona of 5 appendages, each stalked with cordate apex and 2 incurved lobes, 1 mm long, 1 mm wide. Staminal column 2.5 mm long; anther wings 0.75 mm long; anther membrane ovate, 0.75 mm long; stigma obtuse, 0.25 mm long. Pollinia *ca* 0.5–0.6 mm long, *ca* 0.1–0.2 mm wide; translators *ca* 0.3 mm long, *ca* 0.1 mm wide; caudicles 0.3 mm long, *ca* 0.1 mm wide. Follicles fusiform, terete in cross-section, glabrous, 4.5–5 cm long, 0.3 cm diameter; seed 2–2.5 mm long, 1 mm wide; coma white, 13–15 mm long. **Fig. 3.**

Specimens examined: Papua New Guinea. Sirinumu area, *ca* 7 miles [11.2 km] S of Sogeri, Sep 1962, *Schodde* 2913 (BRI; CANB *n.v.*); Bisiatabu, Astrolabe Range, Jul/Aug 1918, *White* 247 (BRI). Australia. Queensland. COOK DISTRICT: Near Massey Ck, *ca* 16 miles [25.6 km] NE of Coen, Oct 1962, *Smith* 11705, 11925 (BRI); Thursday Is, May 1893, *Cowley* AQ216517, 216518 (BRI); ditto, undated, *Duff* AQ216519 (BRI); Iron Range, Portland Rd, Apr 1976, *Jackes* AQ216514 (BRI); Hammond Is, Jun 1897, *Bailey* AQ216513 (BRI); *ca* 15 km upstream from the upper crossing at Massey Ck on Silver Plains Stn, Sep 1979, *Clarkson* 2640 (BRI); 10 miles [16 km] NE of Iron Range, Apr 1944, *Flecker* AQ216490 (BRI); Bamaga, *ca* 27 km SW of Cape York, Oct 1965, *Smith* 12665 (BRI); Bamaga Mission, 11.2 km SW of Cape York, Oct 1965, *Smith* 12342 (BRI); Bamaga District, "Long Scrub", S of Cody Hill, May 1962, *Webb & Tracey* 6090 (BRI; CANB *n.v.*); 13°53'S, 143°15'E, Nov 1984, *Liddle* 448 (BRI). **Map 3.**

Habitat: Plants of *D. major* are epiphytic on various hosts and are usually found in swampy habitats dominated by *Melaleuca* species.

Notes: *D. major* is renowned for the remarkable pitcher leaves harbouring ants that have fascinated various authors (reviewed by Walker 1985).

Conservation status of Australian *Dischidia* species: All three species are widely distributed in coastal, north-eastern tropical Queensland and are often locally abundant. Due to popularity in horticulture, some population destruction is occurring and the continued collection of material should be discouraged. At this stage none of the Australian species are endangered.

Acknowledgements

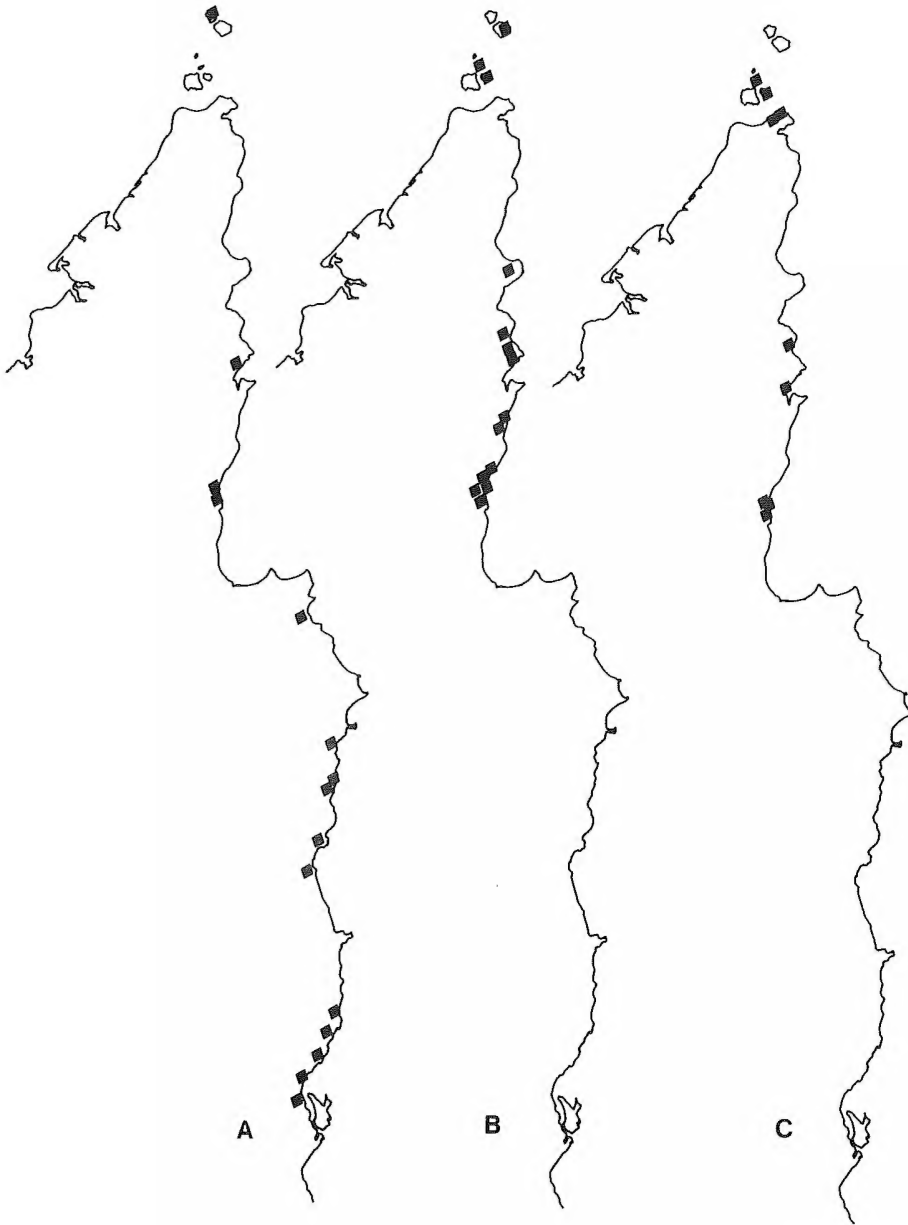
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Fig. 3. *Dischidia major*. A. flower, side view $\times 5$. B. flower, apical view $\times 7.5$. C. flower, side view showing interior $\times 5$. D. corona, apical view $\times 10$. E. pollinarium $\times 10$. F. shoot with inflorescence $\times 0.5$. G. pitcher leaf showing interior $\times 0.5$. A-G Liddle 448.



Map 1. Distribution of *Dischidia* spp. in northern Queensland. A. *D. ovata*. B. *D. nummularia*. C. *D. major*.